**Main Idea: The difference between series and parallel circuits.**

**Sub-Topic #1: Circuits connected in series**

The equation to find the equivalent resistance (Req) of a series circuit is:

The unit for Resistance is ohms

**Example #1:**

A 6.0 ohm resistor, a 12.0 ohm resistor, and a 20.0 ohm resistor are connected in series across a 21 v battery. The total voltage drop across the 6.0 ohm resistor is:

First, we find the equivalent resistance of all resistors. Then, we divide the voltage by the resistance to get the overall current. Finally, we multiply the current by the individual resistor to get the individual voltage drop.

**Sub-Topic #2: Circuits connected in parallel**

The equation to find the equivalent resistance (Req) of a parallel circuit is:

The unit for Resistance is ohms

**Example #2:**

Four resistors of 15.0 ohms are connected in parallel. A combination of four resistors 15.0 ohms each is connected in series along with the parallel arrangement. What is the equivalent resistance of the circuit?

First we find the equivalent resistance for the parallel circuits. Then, find the resistance of the other resistors in series. Add the sum of these to find the total equivalent resistance

of parallel=3.75 ohms

…

of series=60 ohms

TOTAL

**Additional Resources:**

[**http://www.allaboutcircuits.com/vol\_1/chpt\_5/1.html**](http://www.allaboutcircuits.com/vol_1/chpt_5/1.html) **(review and explains differences)**

[**http://physics.bu.edu/py106/notes/Circuits.html**](http://physics.bu.edu/py106/notes/Circuits.html) **(examples and practice problems)**

[**http://www.youtube.com/watch?v=E8AZBR8Zz04**](http://www.youtube.com/watch?v=E8AZBR8Zz04) **(video Lesson)**